# CARNIVOROUS PLANT NEWSLETTER

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Journal of the International Carnivorous Plant Society

Volume 27, No. 2 June 1998

# CARNIVOROUS PLANT NEWSLETTER

**Official Journal of the International Carnivorous Plant Society**

**Volume 27, Number 2**
**June 1998**

Front Cover: *Sarracenia* 'Ladies-in-Waiting'

Back Cover: *Drosera hamiltonii.* Photograph by L. Logoteta.

Carnivorous Plant Newsletter is dedicated to spreading knowledge and news related to carnivorous plants. Reader contributions are essential for this mission to be successful. Do not hesitate to contact the editors with information about your plants, conservation projects, field trips, or noteworthy events. Contributors should review the "Instructions to Authors" printed in the March issue of each year.

Views expressed in this publication are those of the authors, not the editorial staff.

All correspondence regarding dues, address changes and missing issues should be sent to the ICPS c/o the Membership Coordinator. Do not send such correspondence to the editors. Checks for subscriptions and reprints should be made payable to the ICPS.

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# Letter from the Editor: Our Lost Members

Barry Meyers-Rice

Approximately a year ago tragedy struck the International Carnivorous Plant Society when a computer crash destroyed our membership database. Using incomplete database back-ups, our Secretary/Treasurer Ken Cusson completed the Herculean task of rebuilding the membership information. But in the meantime, many of our members have not been receiving their issues of Carnivorous Plant Newsletter. This is very frustrating for them, and infuriating for me. I spend 100-200 hours on each issue of the newsletter (editor Jan Schlauer and our page layout wizard Steve Baker also work industriously). It drives me batty to think the fruits of our labors are not being distributed to our membership.

If you are still not receiving your issues of Carnivorous Plant Newsletter, please contact Rick Walker (MS 26U4, P.O. Box 10350, Palo Alto, CA 94303-0867, USA) and explain the situation to him. Rick will need to know your complete address, when you paid your dues, and which issues you have not received. If you have email, contact me (bazza@ucdavis.edu) with the same information and I will tell you if you are on the membership roster. If you are reading this note and know a member of the ICPS who is not receiving their issues of Carnivorous Plant Newsletter, have them contact Rick! In most cases Rick will know which issues our various members have not received and when they paid, but just requires an address.

Attention nomadic members—if you move, tell Rick your new address. Some countries do not forward mail for very long, so we can lose contact with you if you do not keep us informed.

I promise you, we are trying to get Carnivorous Plant Newsletter to every member of the ICPS. Please help us by contacting Rick if you are not getting your issues, and do not lose faith in the ICPS or the benefits of membership.

# Announcement

Rick Walker, ICPS President

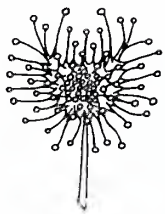
Due to problems with Carnivorous Plant Newsletter's bulk mailer service, the March issue of Carnivorous Plant Newsletter was shipped unacceptably late. As a result, many ICPS members did not learn about the upcoming ICPS Election and Call for Nominations until after May 1, the deadline for submitting election platforms!

If you want to run for an officer or board position, please send a 250 word election statement to Rick Walker at my address inside the front cover of Carnivorous Plant Newsletter or by email to (walker@opus.hpl.hp.com). The revised deadline is August 1.

Please consider running for office. Your help is very much wanted, appreciated and needed!

# Savage Garden: Highs, Lows, and Media

Peter D'Amato
California Carnivores



Keywords: cultivation:general, planting media

## Highs: Another Tortured Carnivorous Plant

Last autumn I took a *Pinguicula agnata*—one of the Mexican butterworts—out of my potted terrarium and placed it on my screened porch here in northern California. Although the incredibly wet winter was mild, in December we had a brief nasty freeze and the porch hit a low of -4°C (25°F). The butterwort was unharmed. I had previously tortured *P. esseriana* down to -7°C (20°F) with similar results, but this new experiment was interesting because the winter rosette that *P. agnata* forms is not as succulent as those of *P. esseriana* and other Mexican species. I assumed the tender foliage would have been severely damaged after being frozen for several hours. Wrong !

## Lows: Frozen Rainbows

Thanks to Glenn Rankin (of the Bay Area Carnivorous Plant Society) who germinated a large number of *Byblis gigantea* using gibberellic acid, I had a few extra plants I could finally torture. Now remember that this Giant Rainbow plant comes from Western Australia and does most of its growing during the cool, wet winter and spring. By late summer, as the soils dry out, it usually dies down to its woody stem. New shoots develop from this stem when the winter rains return.

One plant I grew in a 10 cm (4 inch) pot on my deck, in full sun, kept permanently wet by a water-tray system. A second plant I put in a wine-barrel bog, along with *Sarracenia*, Venus Flytraps, and other typical bog plants. Kept wet all summer both plants thrived and flowered continuously until November, as I expected, even though summer temperatures rose to 41°C (106°F). In December we were hit by the

*B. gigantea*, by B. Meyers-Rice.

freeze. Both plants were frozen solid.

It is now early March, and after El Niño rains of 180+ cm (70+ inches), the potted plant on my deck has a slowly browning stem and new shoots appearing at its base. I have no doubt this plant will regrow beautifully. In contrast, the plant in the bog was submerged under water for days at a time and was completely shaded in winter. This plant did not survive.

Media: Coco Peat

A few years ago I became a little nervous when there seemed to be an effort to ban peat moss harvesting from the *Sphagnum* bogs in Canada. The removal of peat for horticulture has become controversial. This is understandable, for while peat moss companies claim to do their best to return these ravaged habitats to the road of recovery, peat moss beds take hundreds of years to form, and one would imagine the destruction of these wetlands to be incredible.

In defense of the Canadian peat companies, Canada holds 25% of the world's peat bogs, but less than .02 percent (160 $km^2$ or 40,000 acres) is being mined for horticulture. Almost none is used for fuel. On the other hand, of the countries that use peat for fuel, Ireland has only 5% of its peatlands remaining, Finland has 50% left, and Russia—which accounts for 93% of the world's peat production—is also mining their peatlands at an alarming rate.

My own philosophy—shared by most—is that whenever possible, whatever humans use in life is best grown and raised by them, rather than removed from rapidly diminishing natural habitats. What if peat harvesting the future was seriously curtailed? Most peat moss in horticulture is used as a soil amendment, and can be easily replaced by various manufactured mulches using recyclable products. But can we grow Venus Flytraps in anything but good old *Sphagnum* peat moss?

In the last couple of years a new product has appeared in horticultural trade called "Coco Peat." It is manufactured from the fibrous husk of the seed of coconut palms, which are cultivated by the millions in tropical countries. *Cocos nucifera*—the palm of a thousand uses—offers us yet another product. The husk is ground to the consistency of sawdust, then compressed into solid, lightweight bricks that are pale brown in color. When these bricks are soaked in water they swell in size, turn reddish-brown, and crumble into a consistency almost identical to *Sphagnum* peat moss. Like *Sphagnum* peat, it holds a surprising ten times its weight in water. Although not quite as acidic as peat moss, Coco Peat is still an impressive 5-6 on the pH scale, 7 being neutral.

I know of only one person who has used the product for *Sarracenia* and Venus Flytraps for over a year, and he has had good results. I myself am now experimenting with it. After eight weeks, it is so far, so good, for a Venus Flytrap, a Cape Sundew (*Drosera capensis*), *D. schizandra*, and a sweet trumpet (*Sarracenia rubra*). It should be an excellent ingredient in soils for plants such as Mexican butterworts, *Nepenthes*, *Heliamphora*, and *Byblis*.

That Coco Peat is rapidly becoming popular in the nursery trade became evident to me at the recent NorCal Trade Show in Northern California. Almost every wholesale exhibitor dealing in soil products had Coco Peat prominently displayed, and free samples were readily available. In small quantities it is more expensive than peat moss, but the wholesalers I spoke with expected it to become competitive in time.

# New Cultivars of *Sarracenia* from North Carolina: *Sarracenia* 'Dixie Lace' and 'Ladies-in-Waiting'

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Received: 7 April 1998

Keywords: cultivar: *Sarracenia* 'Dixie Lace', *Sarracenia* 'Ladies-in-Waiting'.

## Introduction

We are presenting two new cultivars of *Sarracenia* which have been noted in several horticultural trade magazines since the autumn of 1997 (e.g., American Nurseryman, December 15, 1997; Nursery Management and Production, Vol. 14(2) 1998). Both have been asexually propagated in tissue culture by Dr. Sherry Kitto at the University of Delaware and subcultured by Sandra King at SMK Plants. They have been released commercially by Niche Gardens: *Sarracenia* 'Dixie Lace' was in their Fall 1997 catalog; 'Ladies-in-Waiting' was in the Spring 1998 catalog.

Both cultivars resulted from a long period of hybridization and selection of *Sarracenia* that started about 1985 as a collaborative effort between the two authors. Other cultivars we produced were registered in Carnivorous Plant Newsletter in 1987 (16:2, pp. 39-42). Of these, 'Moore's Melody' still persists and will be commercially available in the future; the others have proven unsatisfactory in the long run or have gone extinct! To our knowledge, *Sarracenia* 'Dixie Lace' is the first named *Sarracenia* hybrid cultivar to be sold commercially as tissue cultured material. *Sarracenia* 'Ladies-in-Waiting' is the second.

We still follow the general criteria for selecting cultivars that we reported in 1987. Our two new cultivars have been under observation for 9 and 13 years. They have proven to be outstanding and interesting plants that grow that well and attract attention when displayed. They were also survivors in the many efforts to get hybrids into tissue culture. It was not easy, and we feel fortunate to have come this far with them.

## *Sarracenia* 'Dixie Lace'

This specific clone was selected in 1993. It resulted from a 1988 pollination at the University of North Carolina at Charlotte (hereafter UNCC) that germinated in 1989 (seed lot 88-14). The female parent was a natural hybrid between *Sarracenia leucophylla* and *S. alabamensis* subsp. *wherryi* (given the unregistered horticultural name "Cotton Patch") collected in Perdido, Alabama in 1985 and grown at the McMillan Greenhouse at UNCC. The pitchers resemble *S. leucophylla*, although only up to 30 cm (12 inches) tall, and are distinctly pubescent. The male parent was an artificial hybrid of *Sarracenia psittacina* and an unknown partner, probably *S. purpurea*, made by Dr. Warren Stoutamire, and given to the North Carolina Botanical Garden (hereafter NCBG) prior to 1985. That hybrid was unofficially called "Snorkle" and continues to be grown in the collections of both institutions.

The pitchers are shaped like a simple smoking pipe lying flat on the ground with the bowl end turned up. The pitchers are uniformly deep red, and up to 15 cm (6 inches) long.

'Dixie Lace' is a distinctive plant (Figure 1). It quickly grows into a multi-crowned clump and flowers freely. Its sturdy pitchers are produced throughout the growing season. Many pitchers survive well into the winter, even after severe cold (down to -7°C or 20°F). The plant has survived temperatures of -18°C (0°F). However, protection from prolonged cold allows the plant to remain attractive throughout the winter. Flowering occurs at mid-season, and the red flowers are similar to those of the parents. 'Dixie Lace' has been grown in full sun outdoors in beds and in pots in a medium of peat:coarse silica sand (1:1). The pitchers are about 25 cm (10 inches) tall, and are poised erect to slightly arching outwards. The hood shows the *S. psittacina* character of being squared-off at the front and tightly closed when the pitchers first elongate. Later, the hoods of most pitchers flatten and form an opening underneath a strongly rounded hood with laterally flared sides. The pitcher tube gradually enlarges to more than 4 cm (1.5 inches) wide below the hood. The surface of the pitcher tube is rich maroon with many white spots between strong dark red veins. The hood has a yellowish-green background with a very strong pattern of large primary and smaller secondary veins—in strong light the hood becomes golden toned. White spots on the hood may be absent or occur in patches. In summary, the erect pitchers with squared-off hood fronts, the very strong pattern or dark red veins, and the two-tone appearance of the upper-pitcher/hood combination are distinguishing features of this hybrid selection.

The name 'Dixie Lace' is in reference to the Deep South of the USA where the parents are native, and the strong lacy appearance of the reticulate vein pattern on the hood. Since the pitchers vary in the detail of color and form of the hood over the growing season and under different amounts of light, we feel this cultivar offers a great charm that teases the imagination in trying to describe its subtle nuances of character.

*Sarracenia* 'Ladies-in-Waiting'

Dr. Warren Stoutamire gave this specimen to the NCBG in 1985 as a single seedling (NCBG accession number 1985-0885). It is a hybrid of *Sarracenia leucophylla* × (*S. rubra* × *S. psittacina*). The pitchers are 35 cm (14 inches) tall, or more. They are stiffly erect with a very slight outward curve, and are completely hairless on the outer surface. The upper 1/3 of the pitcher gradually enlarges and bears a slightly arching hood with a gaping mouth (orifice). The opening of the orifice can be up to 3 cm (1.25 inches) wide. The hood is 3-4 cm (1-1.5 inches) long and 5-6 cm (2-2.5 inches) wide with a distinct ruffle along the edge, reminiscent of the *S. leucophylla* parent. Stiff hairs to 1 mm long are inside the hood. The modest size of the pitchers comes from the *S. rubra* parent. The small red flowers are also very much like *S. rubra*. Characteristic of the *S. psittacina* parent, the back of the hood and upper pitcher have prominent irregular white spots, and the pitcher's interior is profusely lined with long hairs to 2 mm long. You can see this hybrid exhibits characteristics of its three parents.

The coloration of the pitchers is remarkably beautiful (see Front Cover). The green of the lower pitcher gradually gives way to a uniform rich maroon-red in the upper half and hood. The enlarged upper pitcher and hood are marked with distinct white spots. The late-summer pitchers in the cover photo were grown in full sun all day long and are especially well colored. The pitchers retain their color well into the fall, but turn brown in winter, whether exposed to freezing temperatures or not. This clone survives temperatures as low as -18°C (0°F) with no adverse affects as long as the roots are not exposed to drying. Pitchers are produced all season—an

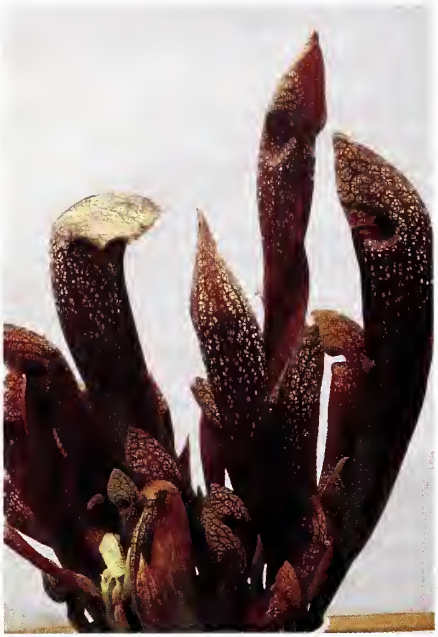

Figure 1: *Sarracenia* 'Dixie Lace'

advantage over the seasonal pitcher production of the *S. leucophylla* parent. Taking a cue from *S. leucophylla* genes, however, the best and largest pitchers are exhibited in late summer and fall. There are no phyllodia. The plant as a whole is thin-textured but sturdy, holding up to rain and wind. Yet there is a strong feeling of elegance and delicate ruffles, leading us to contrive the affectionate name 'Ladies-in-Waiting', alluding to association with royalty.

Both cultivars are available through Niche Gardens (1111 Dawson Road, Chapel Hill, NC 27516 USA, http://www.nichegdn.com) and Plant Delights Nursery (9241 Sauls Rd., Raleigh, NC 27603 USA, http://www.plantdel.com).

Figure 1: *Darlingtonia californica* 'Othello'. Article on page 41.

# *DARLINGTONIA CALIFORNICA* 'OTHELLO'

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Keywords: cultivar: *Darlingtonia californica* 'Othello'.

Iago: *O! beware my lord, of jealousy;*
*It is the green-ey'd monster which doth mock*
*The meat it feeds on....*
W. Shakespeare, *Othello*

## The Nature of Cultivars

As an editor of Carnivorous Plant Newsletter I have the luxury of being able to peek ahead at the articles that will be appearing in future issues. I see cultivar descriptions on the way. Even though cultivars have been discussed in the newsletter before, they are still widely misunderstood by carnivorous plant growers. In this article, I hope to clarify some common misconceptions about cultivar propagation.

First, you may be wondering just what is a cultivar anyway! The term cultivar is a contraction of cultivated-variety, and means a plant (or set of very similar plants) which has some noteworthy characteristics. Furthermore, a cultivar must be described in some widely published journal and the author of the cultivar description must register with an International Registration Authority.

If you look at the seed bank, you see we have plenty of interesting plants available with descriptors after their names (such as —veined or —wide leaf). These are not cultivars because the plants have not been properly described in a publication. If you obtain seed of *S. flava*—veined and grow it, you have an idea of what to expect but cannot really be sure. Is the venation on the pitcher tube? the lid? or both? Is the venation actually on the petals? Is the plant a red-throated type? Is the plant vigorous or weak? All this is uncertain. But if you have a cultivar you know that you have a plant selected for a distinct set of exceptional qualities—in essence a pedigreed plant.

Many people mistakenly think that cultivars may only be propagated by vegetative (asexual) means such as cuttings or tissue culture. The truth is that cultivars may be propagated by any method, as long as the plants resulting from propagation still match the original cultivar description. This is why the cultivar description is so important. Consider the two *Sarracenia* cultivars described in this issue (pages 38-40). The unique beauty and character of each derive from a balance of many components such as pitcher size and color pattern, plant durability, flower color, etc. In order to propagate either cultivar and retain all these characters in the same balance, you must use vegetative means. Even self pollinating these plants would produce a new generation of plants very much unlike the originals, and would therefore no longer be the cultivars Larry Mellichamp and Rob Gardner produced.

On the other hand, if a cultivar has characteristics that are all faithfully reproduced even by sexual propagation (i.e. by seed), then the seed-grown plants which match the cultivar description would themselves be members of that same cultivar. For example, suppose a *Dionaea* cultivar that always had two traps per leaf was developed and named *Dionaea* 'The Hydra'. If seed obtained by selfing *Dionaea* 'The Hydra' yielded offspring that were also double-trapped, they would be *Dionaea* 'The Hydra'. Suppose you crossed this cultivar with a normal *Dionaea*, and of the seed only 25% of the resulting plants had double traps—those new double-trapped plants would also be specimens of *Dionaea* 'The Hydra'.

You can always tell if a plant in Carnivorous Plant Newsletter is a cultivar because we always enclose cultivar names with single quotes, instead of the dash or double quotes we use for plain descriptive information. Look at the seedbank listing for examples. I encourage you to adopt this typography in your own collection lists.

In another article I will describe how to establish cultivar names for noteworthy plants you may have developed in your own breeding programs. You may be surprised at how easy it is. Indeed, in my opinion the greatest task for the originator of a cultivar is ensuring the plant becomes widely cultivated by many people. Make sure you have at least a few dozen specimens to distribute before you publish a cultivar description. It is useless to have a cultivar which is grown by one petty person who greedily monopolizes all the specimens of that plant, lording them over other horticulturists. Such a cultivar is doomed to extinction because of the inevitability of greenhouse power failures, errors in cultivation, or even death of the cultivator.

## The Nature of 'Othello'

In the spring of 1997 I discovered that a seep in the Californian Sierra Nevada housed an anthocyanin-free form of *Darlingtonia californica* (Meyers-Rice, 1997). While an exciting find, in all other respects the plant is identical with the other *Darlingtonia* plants at this site. I could award this plant a new Latin name (perhaps at the rank of variety or form), but I do not think such a minor color variant merits such a major designation. However, since this plant is of considerable interest to horticulturists, it deserves a cultivar name—*Darlingtonia* 'Othello'.

The cultivar *Darlingtonia* 'Othello' is characterized by one feature—a lack of red pigment in the leaves and especially the flowers (Figure 1, page 40, bottom). As such, this cultivar may be propagated by seed as long as the resulting plants also lack anthocyanin. This cultivar measures well against other horticultural standards—its numerous pitchers are large, well-formed, and long lasting, and the plant liberally produces new plants by stolons.

> A greenish complexion was formerly held to be indicative of jealousy, and as all the green-eyed cat family "mock the meat they feed on", so jealousy mocks its victim by loving and loathing it at the same time.
>
> Brewer's Dictionary of Phrase & Fable, 1894

*Darlingtonia* 'Othello' is securely established in cultivation for I have already distributed seed to seedbanks around the world, and the seed is germinating readily (Wim Leys, personal communication, 1998; and others). Additional seed will be harvested during the 1998 growing season for distribution. All the progeny that germinate and bear green flowers will fit the description of *Darlingtonia* 'Othello'.

This year *Darlingtonia* 'Othello' will be tested for the presence of anthocyanin by Phil Sheridan at Meadowview Research Station. It may be that tiny amounts of this pigment do occur in the plant. Since the main character of this cultivar is its green flowers, such a finding would be interesting but not important to the validity of its cultivar name.

Why the epithet 'Othello'? Shakespeare's tragic figure was great and noble, but bedeviled by a furious jealousy. As his twisted companion Iago reminded him, jealousy is symbolized by the color green. Now there are two Othellos, one being Shakespeare's general mocked by the "green ey'd monster" of jealousy, and the other the voracious plant that feeds upon the meat drawn to its green maw.

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Meyers-Rice, B.A. 1997, An Anthocyanin-Free Variant of *Darlingtonia californica*: Newly Discovered and Already Imperilled, Carniv. Pl. Newslett., 27: 129-132.

Trehane, P., Brickell, C.D., Baum, B.R., Hetterscheid, W.L.A., Leslie, A.C., McNeill, J., Spongberg, S.A., and Vrugtman, F. 1995, International Code of Nomenclature for Cultivated Plants—1995, Wimborne, United Kingdom.

# International Carnivorous Plant Society Seedbank

TOM JOHNSON, COORDINATOR
P.O. Box 12281
La Crescenta, CA 91224-0981 USA
tjjohns@primenet.com
http://www.primenet.com/~tjjohns/seed.htm

*Byblis gigantea*
*Darlingtonia californica*
*D. californica*—Florence, Lane Co., Oregon
*Ibicella lutea* —5 seeds per packet
*Pinguicula grandiflora*
*P. vulgaris*—Vernar, Slovak
*P. sharpii*
*Utricularia uliginosa* (1)
*Sarracenia alata*—various red forms, Mississippi (2)
*S. flava*
*S. flava*—green with yellow/gold tops (2)
*S. flava*—Ben Hill Co., Georgia
*S. flava*—Fitzgerald, Ben Hill Co., Georgia
*S. flava*—veined, Fitzgerald, Ben Hill Co., Georgia
*S. flava*—New Bern, Craven Co., North Carolina (3)
*S. flava*—cut throat, Bulloch Co., Georgia
*S. leucophylla*
*S. leucophylla*—green with white & red tops
*S. minor*—Fitzgerald, Ben Hill Co., Georgia
*S. oreophila*—green (inquire)
*S. psittacina*—Fitzgerald, Ben Hill Co., Georgia
*S. purpurea* subsp. purpurea
*S. purpurea* subsp. *purpurea*—marl bog form, Bruce (Wisconsin?)
*S. purpurea* subsp. *purpurea* f. *heterophylla*
*S. purpurea* subsp. *venosa* var *burkii*—Baldwin Co., Alabama (1995 seed)
*S. minor* & *psittacina*—Fitzgerald, Ben Hill Co., Georgia, seeds mixed
*S. rubra* subsp. *gulfensis*—anthocyanin-free, Santa Rosa Co., Florida
*S. alata* × *leucophylla*
*S. flava* × *leucophylla*—Milton, Santa Rosa Co., Florida
*S. flava*—Okefenokee Giant × *purpurea* subsp. *venosa*
*S. flava* × *rubra*—green with gold tops
*S. leucophylla* × *oreophila* selfing
*S. oreophila* × *flava*
*S. oreophila* × *purpurea* subsp. *purpurea* selfing
*S. oreophila* × *rubra* selfing
*S. purpurea* × *flava*
*S. purpurea* × *leucophylla*
*S. psittacina* × *minor*—Fitzgerald, Ben Hill Co., Georgia
*Drosera affinis*
*D. aliciae*
*D. anglica*—N. Slovakia
*D. anglica*—Czech Republic
*D. anglica*—Hawaii
*D. anglica*—Plumas Co., California
*D. binata* var. *dichotoma*—small
*D. binata*—North Plains, New Zealand
*D. brevifolia*—white flower, Hampstead, North Carolina
*D. burmanni*
*D. burmanni*—Beerwah, Queensland
*D. capensis*—green
*D. capensis*—red
*D. capensis*—narrow leaf
*D. capensis*—white flower
*D. capensis*—purple flower
*D. capillaris*
*D. collinsiae*
*D. communis*
*D. dielsiana*
*D. filiformis* var. *filiformis*
*D. montana*
*D. natalensis*
*D. nidiformis*
*D. pulchella*—pink flower
*D. rotundifolia*—Mendocino Co., California
*D. rotundifolia*—Czech Republic
*D. rotundifolia*—Del Norte Co., California
*D. spatulata*
*D. spatulata*—hairy sepals, Gympy, Queensland
*D. spatulata*—pink flower
*D.* sp.—Magaliesburg
*D.* sp.—Rhodesia
*D. dielsiana* × sp. Transvaal

A number in parentheses indicates limited numbers of seed packets remaining.

$1 per packet, IRCs accepted. All correspondence and orders within the US must include a self-addressed, stamped envelope. Postage is $.32 for a seedlist, $.43 when ordering seed. All correspondence with the seedbank must be accompanied by a self addressed stamped envelope. All seed contributions are gratefully accepted. Please use bubble wrap to protect the seeds from postal abuse—this will require additional postage for shipping.

# News & Views

Isao Takai (1949-5, Imoguki, Kisai Town, Saitama-Pref. Japan 347-0112) sent us some lovely Japanese stamps commemorating Waterwheel Plants (*Aldrovanda vesiculosa*). The accompanying information says: "The environmental protection movement has been gaining momentum throughout Japan in recent years....The Kanto Bureau of Postal Service has issued a series of stamps under the theme of environmental protection, featuring marshes and lakes. The second collection of such stamps will focus on the Natural Habitat of Waterwheel Plants at Hozoji-numa Pond. Hozoji-numa Pond, a designated national area located in Hanyu City in the Kanto region, is the only place where wild Waterwheel Plants can be seen. Waterwheel Plants used to be found in wetlands along the Tone, Shinano, and Yodo rivers....however, only those at this pond have survived the various changes, including land development....[Shown] on the stamps are Waterwheel Plants blooming with white flowers in summer and the scenic beauty of Hozoji-numa Pond in the background."

Barry Meyers-Rice (P.O. Box 72741, Davis CA 95617, USA) learned about the Wetlands Reserve Program's (WRP) web site. This program is of interest to anyone involved in restoring or enhancing wetlands. The US Department of Agriculture (USDA) will pay for 75% of the cost for a landowner to restore their wetlands, as long as the landowner agrees to maintain the restoration for at least ten years. The web site for this project says that "Almost any request for cost-share funds to restore substantial wetland function and values at a reasonable cost under a ten year agreement will be approved." Other programs are also available. For more information, check the federal listings of your phone book for the USDA Service Center. You can also join the program through any conservation district office. These are listed in the county government section of most phone books, sometimes under the alternate name "Soil and Water Conservation Districts." The WRP web site is: http://www.fb-net.org/wrp-afct.htm.

O. Clyde Bramblett (18950 S.W. 136th Street, Miami, FL 33196) mailed us an article that appeared in the October 2, 1997 issue of the Miami Herald. The article reports that St. Joe Corporation, the largest private landowner in Florida, bought Arvida Company (a real estate developer). Now St. Joe Corporation is "aggressively pursuing residential development for the first time in history." This is bad news because most of their 1.1 million acres (4500 $km^2$) are in the Florida panhandle, an area that contains much of the finest remaining USA habitat for *Sarracenia* and other carnivorous plants. Arvida Company knows how to gobble land because it has developed 35,000 homes and 50 master-planned communities since 1958. "We intend to be all over the state."

Robert F. Sheppard (134 Royal Crest, Los Alamos, NM. 87544 USA, (505) 661-0240, sctrfcs@aol.com) wrote to us about the book by Allen Lowrie, Carnivorous Plants of Australia, Vol. 1. "The first in a popular three volume series, this book is no longer in print and is unavailable worldwide. Allen Lowrie has agreed to approach his publisher regarding a reprint of the book if sufficient interest is demonstrated. It is not yet known what numbers a reprint will demand or what the corresponding cost per book would be—it is hoped a reprint order of 300 to 500 copies might be acceptable. The price for a copy from the initial run in 1989 was approximately AU$38.00, and inflation and a smaller print run will undoubtedly have an effect on the reprint per unit cost. As a first step towards requesting a new printing run of this book, the number of carnivorous plant enthusiasts who would be interested in purchasing a reprint copy needs to be determined. Once the number of requests are known the cost per copy will be declared by the publisher. If you are interested in obtaining a reprint copy of this book (volume 1) please contact me, stating the number of copies desired and the choice of format preferred (hard cover, soft cover or photocopy with colour photographs) by August 1, 1998." (Note—The International Carnivorous Plant Society encourages those interested in this book to contact Robert Sheppard, but is not financially involved in this project.)

Since the originator of the Loch Ness Monster revealed Nessie was a hoax, have the mysteries of life disappeared? Apparently not—Peter D'Amato (California Carnivores, 7020 Trenton-Healdsburg Rd., Forestville, CA 95436) sent us reflections on psychic *Sarracenia*: "The recent El Niño weather phenomenon brought more than floods, mudslides, and record rains to North America—it also brought warm winter weather. Carnivorous plant growers California to Georgia have noticed that *Sarracenia* grown in greenhouses or outdoors started their seasonal growth one to two months earlier than usual. Flower buds started popping as early as New Year's, and by mid-February some plants looked like they normally do in mid-March. Strangely enough, I had two phone calls in January concerning early *Sarracenia* growth. One fellow from the upper midwest has grown his plants for several years by placing his dormant plants in his basement for winter. This year, even in his basement, flowers and pitchers began growth in January. A second person had a similar story, although his dormant plants were refrigerated!"

## Errata and Announcements

Issue 26:2, page 53: the normal flower color for the last four species in Table 1 should be listed as yellow. Variant flower colors should not be listed for the last three species.

The Conference of the Southeastern Chapter of the International Carnivorous Plant Society that was scheduled for October 2—4 in Mobile, Alabama, has been canceled due to time conflicts. The organizers will announce plans for the next conference when they have been finalized.

News about the Logo Contest: we have been receiving logo entries for the contest, but would like to see a few more submitted before we decide upon a winner. So we are extending the logo contest deadline until August 15th. Keep sending in those logos!

In issue 27:1, the advertisement for Triffid park incorrectly listed its old internet contact information. The email and web addresses for Triffid park are now triffid@dingley.net and www.dingley.net/triffid. We encourage you to browse their internet site.

While the International Carnivorous Plant Society is a global organization with occasional international meetings, it has various chapters and groups of members who meet from time to time. The editors of Carnivorous Plant Newsletter encourage these groups to send us notices about their meetings. We can publicize your event if you send us information early enough (for example, 21 June is the deadline for the September issue, 21 September is the deadline for the December issue, etc.). We want report on your group's activities!

## Enticing *Drosera hamiltonii* To Flower

Barry Meyers-Rice
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Davis, CA 95617

Keywords: cultivation: *Drosera hamiltonii*

I am a connoisseur of mucilage. Why, I do not know, but those glistening jewel-like beads on *Drosera* mesmerize me. I have high standards for mucus—the gooey balls on *D. regia* are too large for my tastes, those on *D. petiolaris* too small. *D. binata* var. *dichotoma* puts on a fine show, but its variously-sized droplets alarm me. But when you are talking about the glittering adhesive dew drops on *D. prolifera, D. burmanni*, or *D. rotundifolia*—that's the right track!

The problem with *Drosera hamiltonii* is in its glands! Most of the year its glandular tentacles are ratty and miserable, like a mangy dog fresh from an ocean bath. Still, I love to grow it. It has those flowers....

This sundew is fairly sturdy, and can be grown a number of ways. It does not care too much about soil mix, there are no secret formulae—it grows well in sand and peat combinations, pure milled *Sphagnum* (my favorite), or live *Sphagnum*. It has long ropy roots but I do not accommodate them with a deep container. Instead I use a shallow pot only 6 cm (2.5 inches) deep and let its roots coil in the bottom. I give it full sun in a greenhouse or a bright position in a terrarium (my brightest terraria have six fluorescent bulbs over them). I use purified water, and keep the plant continuously moist. I have tried fertilizing them with Miracid (foliar application, once per week following the concentration instructions given on the label), but the plants neither benefited nor suffered from this treatment.

A mature rosette of *D. hamiltonii* is approximately 6 cm (2.5 inches) in diameter. Its leaves hug the ground closely and are remarkable for how, as they grow, they unfurl like a carpet being rolled out (for example, see the photograph in Allen Lowrie's Carnivorous Plants of Australia, Volume 2).

*Drosera* growers know that the way to look into a sundew's health is through its mucous glands (ah yes, the mucilage—my favorite part). Transplant even an indestructible *D. spatulata* too violently and it complains with leaves bereft of viscous slime. What grower of *D. prolifera* does not stop dead in his tracks at the sight of undewy leaves? But with *Drosera hamiltonii*, you must squelch your anxieties and press ahead with your horticulture bravely—those discouraging ungooey leaves will offer no encouragement. Yes, there are infrequent times the plant looks like a

normal sundew, but those are rare days to live for.

I have only been able to propagate this plant vegetatively. I do not bother with leaf cuttings, instead I use root cuttings laid horizontally just beneath the soil surface. However, volunteer plantlets are always springing from the roots winding around the bottom of the root-bound container. This is one reason I prefer to use such shallow containers—I think it encourages the roots to make such plantlets (sometimes the winding roots become so large that the entire soil ball rises out of the pot).

So the good news is the plant is easy to grow, even if it lacks those beloved shimmering ooky orbs. The bad news is that if you want it to flower, you must grow it outdoors. The key is in giving the plant seasonal variations; such annual changes are usually lacking in terrarium cultivation. During the winter I grow my plants with my tuberous and pygmy *Drosera*. Under these conditions the plant rarely suffers a frost, but they do have a chilly winter. During these months they stop growing and often acquire a dull maroon flush throughout the rosette. By early March tall hairy scapes form (Figure 1). These uncoil until they are about 40 cm (16 inches) tall. Each scape may produce a dozen or more flowers, one per day. The first flower of each scape is always the largest and worth racing home during lunch time to see (see Back Cover).

Oh, those flowers! They will take your breath away! Approximately 3—4 cm in diameter and pink to magenta, they will remind you why you love these plants. They even make up for the forlorn leaves so sadly bereft of viscid satisfaction.

Figure 1: *Drosera hamiltonii.* Photograph by B. Meyers-Rice.

# Growing Carnivorous Plants in Italy

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Keywords: live collections: Italy.

It is not often you have had the opportunity to read in Carnivorous Plant Newsletter something that was written by an Italian. Perhaps it is even the first time in the history of Carnivorous Plant Newsletter. Well, from the land of pizza and spaghetti I will tell you the latest news.

In the past few months I visited three carnivorous plant collections in three different cities: Udine, Bologna and Firenze (Florence). In Udine, the most important event of the first official Italian carnivorous plant meeting was the presence of a foreign guest—Fernando Rivadavia, the well known expert on Brazilian carnivorous plants. He showed and commented on some fantastic slides of the flora of South America. The meeting was in Udine because this city has the largest private collection and the only nursery of carnivorous plants in Italy, managed by Furio Ersetti and his wife Lilli Almacolle.

I wish to mention some plants that I have seen there—very beautiful specimens of *Heliamphora nutans, Darlingtonia, Cephalotus,* a *Sarracenia flava* var. *maxima* more than 1 metre high, and a completely black *Sarracenia purpurea* subsp. *venosa* var. *burkii* that Furio bought as the variety "Louis Burke". Near Udine there are other carnivorous plant growers with good collections, such as Lauro Tonini who has impressive *Cephalotus* and *Darlingtonia.* In addition, Fiorello Verona built in his garden a small artificial peat bog for his plants.

Months later I decided with two other friends, Vittorio Saporiti and Alessandro Delfrate (the only carnivorous plant enthusiasts living in Milano), to visit the collection of Andrea Amici, in Bologna. I can not say that I love carnivorous plants as if they were my children, but the passion of Andrea is almost pathological. Anyway, he has a little greenhouse in his garden, with very beautiful *Sarracenia* species (in particular a splendid *S. purpurea* f. *heterophylla*) and hybrids, a threatening *Cephalotus*, a poetic *Nepenthes gymnamphora,* and some provocative *Drosera regia* and *D. falconeri*. I think the health of his plants is due not only to Andrea's devotion, but also to the great quantity of insects that enter the open greenhouse to feed the hungry pitchers.

The best plants are surely the ones of Sergio Cecchi who lives in Firenze. The species are the same, but the worrying thing is the magnitude of their dimensions: 8 cm *Cephalotus* pitchers, 60 cm *S. minor*, 2 meter *N.* × *ventrata* (with 15 cm pitchers), 5 cm *U. alpina* flowers, and so on. I have seen also some *Ibicella lutea* and *I. fragrans*, with really lovable sewer-smelling flowers. (The taxon "*Ibicella fragrans*" has recently been renamed *Proboscidea louisianica* subsp. *fragrans*—ed). Nearly all the plants are grown in pure, green, big, succulent live *Sphagnum.*

In the future maybe I will see also the collection of Gianni Benetti, in Rovigo, who has really thriving plants. Here in Italy there are not many carnivorous plant enthusiasts, so I wanted you to know of their existence. Where the sun shines and everybody is happy, there are some people who have the problems of trying to find others really interested in carnivorous plants, and also those plants that are impossible to obtain (if you are lucky, you can find only a few *Dionaea*, *Pinguicula* and *D. capensis* in shops).

We are establishing a society and if other Italian members of the ICPS want to have information they can write to my address. I sent a letter to some ICPS members to send me *Nepenthes* photos to make a book. The help was very useful and this will be the first Italian carnivorous plant book. If it is successful, I will write a book on *Sarracenia*, and so on. Except for a few hybrids, I do not have many *Nepenthes* species. I grow some lowland species, but they are from tissue culture and too small to be good models.

So, from the smog of Milano, that is all the news. We are few, but diehard. *Ciao*.

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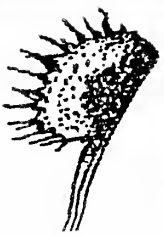

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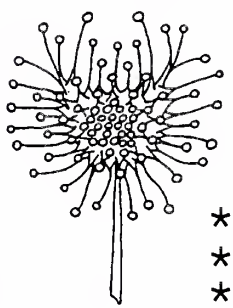

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# Some Uses and Applications of Location Information

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Keywords: conservation: *Sarracenia*

I wish to respond to Barry Meyers-Rice's piece "CLODS, Collectors, and Pseudo-environmentalists" (Carniv. Pl. Newslett. 1996, 25: 122-124). As a person trained in botanical sciences and ecology, I might be able to challenge readers; this is good, for the subject Barry touches on is complicated and full of philosophical viewpoints. These viewpoints are important as we examine our own policies and intentions regarding the conservation of carnivorous plants.

Consider some of the concepts and statements made in the aforementioned article. Barry states, "In the genus *Sarracenia*, location information is only important when trying to puzzle the subspecific identity of *S. rubra* plants or perhaps naturally occurring hybrids." Plants with location information are "living herbarium specimens" in many ways. Like herbarium specimens, an accurately identified, geographically documented plant offers the observer a glimpse into the species. A taxonomist making a dried specimen does not need to collect every individual in a population nor can he or she really determine the "average." The underlying genetic makeup of the plant or its population is seldom obvious. Unlike the dead record, a living plant can contribute different data. For example, forms of *S. flava* from different locations may be genetically distinct. Some may require tannins to produce pigment, others may not. Plants from western Florida might possess a resistance to *Erwinia* bacteria while those from North Carolina are vulnerable. Suppose what looks like the same species from different locations is proven in time to be two or more similar species. If a researcher wishes to examine a larger sample size or habitat to explore the relationship between native environment and plant, site information is critical. Location information also enables researchers and growers to communicate about the plants in detail. If I say to Phil Sheridan, "Of sixteen different clones of *S. flava* from Bay County, Florida we have found twelve to be completely sterile," it has more meaning than if I were to say "Phil, we've found twelve sterile clones of *S. flava*." In short, the locality data of a plant can be more than a collector's fancy. It is a part of the plant's history, part of natural history. To many, this is useless information, but to claim it is only important in *S. rubra* shows a lack of understanding. Those interested in learning more about population/location breeding can read about this in The Virginia Journal of Science, 1995, Vol. 46, #2. Phil Sheridan and David Karowe wrote an article, "The Virginia Pitcher Plant Bogs, Part 3, Is There Inbreeding or Outbreeding Depression in the Yellow Pitcher Plant, *Sarracenia flava* L.?" More studies are currently being done.

As for Mr. Meyers-Rice's "theories" about why collectors want location information: The first, a paragraph suggesting a disease, is not really informative or appropriate, unless entertainment is part of this newsletter's function. The second point Barry makes is probably true for most collectors; site information adds to people's enjoyment. Collector's "mania" is the third theory and also may hold true with many people. One cannot generalize about people's motives and we all should be careful not to fall into the trap of categorizing collectors, lest prejudices form. The

article's last argument negating the thought that "at least the plant will be in collections" is perhaps the most thought provoking. Here, he states: "a few token plants do not represent a viable form of damage control." Further, "CLODS who claim to have conservation on their agenda are either misinformed or unwilling to face their collector's mentality."

Legitimate "rescue" attempts in doomed sites are not meant to be damage control; these are extractions of germplasm, an effort to preserve biodiversity by reducing the loss of organisms. Habitat loss is no less than a tragedy. Often it is too late to contact politicians or use other means of activism. When a bulldozer is clearing a site for tree production, is it a waste of time to collect? Is there any reason to go through the labor intensive process of relocation to a nursery or construct a man-made site? What are some of the considerations?

This is a subject of enormous complexity with countless philosophies. In the 1960's and early 1970's, species reintroduction was a popular notion. In 1885 the American bison population was reduced to about seventy-five animals. Breeders and the formation of sanctuaries have encouraged these "token" survivors to form herds containing tens of thousands of animals. Though success seems hopeless, one must remember that populations change over time. Genetic plasticity allows a population to produce new variations, even if the starting colony is small. Vast acreages of *Sarracenia* probably began as seeds washed into new, available habitats. Obviously, the larger the starter colony, the better. Barry touched on one of the pitfalls when he wrote about selecting an unusual plant for "preservation." In genetics the swing of gene pool makeup is called "genetic drift" and it can alter or destroy conservation efforts and/or radically change the population. It is of prime importance to try to sample, as much as possible, many different individuals. Given that we are finding self-sterility in many *Sarracenia*, saving one plant probably will not prevent the effective extinction of that group, should the habitat be destroyed. How many is enough? No one can say. It depends on each situation and species. When a dozen or more different plants can be shown to produce thousands of variable offspring, I feel some success has been achieved. If these offspring are made available to collectors and hobbyists, then the desire to steal from healthy, protected sites is reduced; even to the unscrupulous, it may not be worth the risk. Poaching can lead to genetic drift.

Man-made or synthetic sites are not popular at this time with conservation groups. I know because I spoke with upper level staff of The Nature Conservancy regarding this and other subjects. This was a wonderful opportunity to discuss the above issues and understand the strategy behind their efforts. There are current tactics that could change as more information accrues and habitat disappears. If synthetic sites were established for *Sarracenia*, or any organism, the best available material would come from location-specific parent stock put back into the same location, as much as possible, so that natural selection could, over time, keep the population evolving.

Documentation is paramount, if reintroduction were attempted. Random planting can lead to confusion of native ranges. Also, natural barriers to prevent local intact communities from intrusion should be considered. Yes, this is a complicated theoretical approach and certainly not a substitute for habitat protection. Often, we can not achieve the best results. That does not mean the activist should give up. I feel a combination of connected growers, conservation organizations, researchers, political activists and others can make a partnership, each respectful of the other, to reduce the devastation and loss of biodiversity as humans reshape the planet. We have no guarantee that our government will continue to preserve habitats. Poachers, political climate and even natural disaster can wipe clean a protected

site. All the legal approaches should be explored. The desires and needs of the people must not be ignored either.

Nearly everyone agrees that education is one of the most powerful tools in conservation efforts. One supporter of preservation can inspire many to join the effort. It is here, too, that location information can be very important. The connection is not immediately obvious, and requires forethought. As a lecturer I bring live carnivorous plants with me to gain audience appreciation for carnivorous plants and their habitats. There is no substitute for a living example. Routinely, we ship plants to schools, universities and to educators across the country so that they too can be more effective. Gardeners are an important force, as they share their work and demonstrate a connection between humans and plants.

As more species are added to the endangered list, our ability to exchange the plants becomes restricted by law, namely the Endangered Species Act and CITES. It is probable that most of the *Sarracenia* will eventually be listed as endangered. To continue to exchange "artificially propagated" plants, a permit is needed. To get that permit, one has to complete an application (among other things) and have it accepted. Page 2, number 3 of the permit application for an endangered species license requires the applicant to "Provide state and specific location of wild origin or captive/artificial propagation:" One needs to list, and verify if necessary, the source. If you can show the plants were legally removed before restriction, then you are more likely to be granted the permit. If you thought specific location information unimportant and your records are weak, you probably will be denied a permit; you must stop shipping those plants. Educators, gardeners and audiences do not see them as often or at all, and the ability to gain support for preservation is weakened by the "distance" between the general population and the plants/habitats.

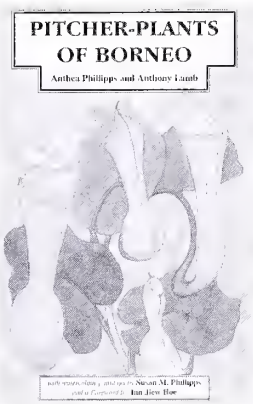
We produce many thousands of *Sarracenia* in a nursery. Our goal is to educate, preserve what we can, and distribute/develop new horticultural entities. Location information is one of our tools. Due to limited numbers, and to keep existing sites a bit less vulnerable to intrusion, we do not casually distribute location specific plants, unless to botanical gardens or researchers; please do not ask us to sell them or provide a list of these. When we have extra plants, we network to find homes for them. We use location information to prevent identity/source loss, examine inheritance, to gain insight into possible habitat or cultural requirements and to communicate with others about what we discover. Greed or status is not part of the equation. Before my time is through on this planet, I can only hope to have helped people appreciate and in some small way encourage the survival of carnivorous plants and their habitats. My collection will ultimately be left behind.

## From the pages of Carnivorous Plant Newsletter 25 years ago

"Don Schnell at last is able to report some good luck with finding pollen in greenhouse grown *Heliamphora heterodoxa*. The plants are becoming quite adapted and mature and seemed to bloom continuously all winter....after a recent two weeks of very damp and misty weather followed by several days of full sun and unseasonably warm temperatures...a fine shower of pollen was seen."

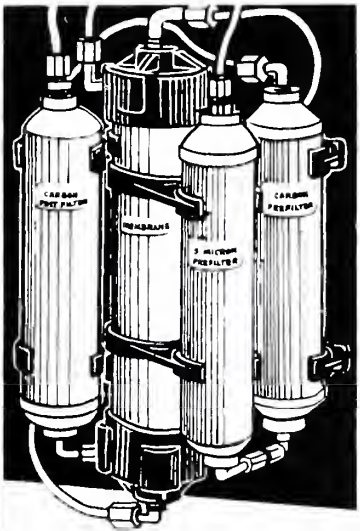
# Book Review

Phillipps, A. & Lamb, A. 1996 Pitcher-Plants of Borneo, 171 pp., 37 watercolor paintings (by S. M. Phillipps), 27 black and white line drawings (most of which are reproductions from Gardeners' Chronicle), 19 photographs, most in color. Foreword by Tan J.H. Natural History Publications (Borneo) Sdn. Bhd., Kota Kinabalu in association with Royal Botanic Gardens, Kew (UK) and Malaysian Nature Society, Kuala Lumpur, Malaysia. ISBN 983-812-009-X RM 80.00 (approx. 25 US $)




This new variation on a theme begun some time ago by Kurata (by his "Nepenthes of Mount Kinabalu", 1976) is a disappointment to all who expected an up to date review reflecting the present knowledge about the Bornean species of *Nepenthes*. The only deviations from the earlier account by the same authors (in Nature Malaysiana 13: 8-27, 1988) are *N. borneensis* and *N. mapuluensis* (which were since described as new species) and the publication of two illegitimate names ("N. macrophylla" and "N. murudensis"; the former is an informally introduced, i.e. illegitimate new combination, the latter is a plain *nomen nudum* without type and Latin description). It is highly regrettable that the authors do not have to offer any new data on the species hitherto known only from Kalimantan (viz. *N. boschiana, N. campanulata, N. clipeata, N. ephippiata, N. mollis, N. pilosa*), and they do not even make efforts to cite more recent field work on these properly (although they refer to it indirectly several times, e.g. pp. 79, 82, 86). The old confusion between *N. fallax* and *N. stenophylla* inherited from Danser (and left unchanged by Kurata) is perpetuated here. The picture and description presented under "N. stenophylla" (pp. 136-138) is once again of *N. fallax*. Nothing is mentioned about considerable doubts if the plants called "N. pilosa" from north Borneo are really conspecific with the species described from Kalimantan (Danser compared the species with *N. burbidgeae*, and he wrote "*N. pilosa* is hardly specifically different by less decurrent leaves and longer and denser indumentum" in 1935). The picture and description in the present book (pp. 121—123) are inaccurate as they do not consider the distinguishing ovate lower and widely infundibuliform upper pitchers (aptly described and depicted by Danser in the protologue). These shortcomings (and several others) are rather astonishing, especially if it is taken into account that Drs. Matthew Jebb and Martin Cheek, who are preparing a monograph on Nepenthaceae for Flora Malesiana, were "scientific editors" of the present book.

However, it may be comforting for the enthusiast that most of the watercolor paintings give a quite accurate impression of the plants in the living condition (which must have been a particular challenge for the artist in those cases in which no living specimens were available, e.g. of the species from Kalimantan!). The book is a nice addition to the collection of any *Nepenthes* amateur bibliophile but it cannot be recommended for scientific purposes. Therefore the association with Kew Gardens, a usually quite reputable institution, seems somewhat strange. (JS)



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Keywords: travelogue: *Drosera*, hybrids, *Pinguicula macroceras*, *Utricularia minor*, Washington (USA).

## Bagley Lake

We, being my wife Cindy, daughter Brenna and I, set off on our annual *Pinguicula* site confirmation/fishing trip one Saturday morning in June of 1996. We had to set off early as it is a six hour drive one way to the site, located on the upper Bagley Lake at Mt. Baker summit in Whatcom County, Washington.

The site first came to my attention a few years ago when Kevin Snively invited me along to see if we could find it. We had found the lake rather easily and as I had brought my fishing tackle along in anticipation, got to fishing after being unable to locate any of the *Pinguicula macroceras* that were supposed to be growing there. The plants only became obvious when, in the process of landing a trout, I happened to look down and realized I had been standing on them and that they were everywhere. We had been looking where we thought they should be and not actually where they occurred. Photos, as well as a few trout, were taken. I have since returned to the site at least once a year to see how they are doing and to fish

the lake.

This trip was as rewarding as the previous. The site is interesting as the lake on which it borders sits in the bottom of a steep walled bowl, with one lip lower—it is there that the lake goes over a sort of dam. There are actually two lakes, the upper larger and rounder than the lower, the two being joined by a creek with a bridge over it. The lakes are crystal clear and very cold. There are lots of alpine plants and interesting rocks as well. When the breeze lets up, the surface mirrors the surrounding mountainsides beautifully. If the sun shines, then the trout start to rise and fishing becomes fun.

The plants occur on the upper lake and are easy to find (if you know what to look for). The plants are covered for at least seven months of the year by heavy snow (ten feet or more) and there is a ski lift nearby. I find it fascinating that anything could survive in conditions like this but they do, and quite well as you can see in the photo (Figure 1).

Brenna caught four nice brook trout and I caught two good sized cutthroat trout. We left there in the late afternoon, with the wind rising, the sun behind the 5400 foot rims, and the temperature becoming quite cold.

## Fish Lake

I found out about this site in the spring of 1995, but did not actually get to it until late in August of that year. I arrived to find a huge *Sphagnum* bog at the south end of the lake. The surface was bone dry and there were no carnivorous plants to find at all.

I returned to the site in the spring of 1996 with a friend, Tom Blaisdell. This time it was much different. After smashing our way through the dense screen of trees and brush that edged the lake and separated us from the bog, we emerged onto the now green and lush surface of the *Sphagnum*. Like walking on a waterbed, we bounced carefully in search of plants (Walking on a floating *Sphagnum* mat or on a "false lake bottom" is extremely dangerous and is not endorsed by Carnivorous Plant Newsletter!—eds). We were not to be disappointed. Soon we were encountering mats of *Drosera rotundifolia*, then *D. anglica*. This was the reason we had come to the site. Fish Lake is one of the few *D. anglica* sites in the state that I know of. We were soon finding large patches of them, thickly enough in places that it was hard to walk without stepping on them. We started to look for the hybrid *D. rotundifolia* × *anglica* and soon were finding them as well. We noticed that the two *Drosera* species were actually occurring in slightly different microhabitats, and that there were differences in growth habits among the individuals of a species. The *D. anglica* seemed to prefer the wetter, lower bits of moss, while the *D. rotundifolia* were more prevalent on the upper surfaces of the hummocks. Also, the larger *Drosera* were always found with at least their roots in water. It seemed

Figure 1: *Pinguicula macroceras* in Washington state.

that the closer to the water, or the more submerged the plants were, the larger they became. We also began to notice a species of *Utricularia* that grew in the holes in the floating raft upon which we walked. It turned out to be the diminutive and rather pretty *U. minor*. It grew amongst the stems of the reeds and grasses that populated the margins of these mini-ponds, getting tangled into the moss as well. I wonder how it survives the dryness of summer when the water level drops well below the surface of the moss, when these little ponds dry out.

There were also supposed to be two other *Utricularia* species there but we did not find them. We did find several species of terrestrial bog orchids in bloom. They were quite pretty. There were also several garter snakes that slithered off as fast as they could at our approach. This very large site is best visited in the spring. By summer the water level drops too far below the surface of the moss and then the location becomes a withered, dried, blasted flat of plantless yellowish packing moss.

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Jay Lechtman, Vice President of the International Carnivorous Plant Society and former newspaper reporter, is an avid netizen (internet citizen and web surfer). His new column sifts through the chatter on the internet and brings you the best of what is fit to print. Without further ado, we bring you...

# Caught On The Net:
# A regular collection of interesting items culled from the ICPS internet discussion group.

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Keywords: cultivation: *Nepenthes*, planting media.

## *Nepenthes* Recipes

Perry Malouf (5717 Namakegan Rd., Bethesda, MD 20816 USA, pmalouf@access.digex.net), who will now be put in charge of the ICPS Cookbook fundraising project (smile), issued a general call to *Nepenthes* growers: "Please post the recipe for your potting mix if it is different from *Sphagnum* and perlite."

Andreas Wistuba (Mudauer Ring 227, 68259 Mannheim, Germany, andreas@wistuba.com): "I use a mix consisting of one-to-one peat moss, clay beads (brand name Lecaton in Germany), and styrofoam (brand name Styromull) for all my *Nepenthes* and *Heliamphora*."

Joe Mazrimas (329 Helen Way, Livermore, CA 94550 USA, sundew@pacbell.net): "I grow most of my large *Nepenthes* in living *Sphagnum* moss with a layer of perlite on the bottom third of a one-gallon pot. Since the moss is living and growing, the medium never needs changing unless you do something to kill it. I give *Nepenthes* only reverse osmosis (RO) water and very dilute fertilizer (Miracid) four times a year. I grow seedlings and 2-5 year-old plants in a German material made by Sera called Pond Water Peat which has good properties for resisting the growth of algae.

It also has resistance to fungus because of its high humic acid content. The material is expensive, about $14.00 US a pound. As a result, we are reluctant to use it on big plants. However we found that adding up to 50 percent perlite seems to extend the product with somewhat less than maximum desirable results. The material comes in a bag of little hard balls of peat between 2 mm and 6 mm in diameter. It is important to soak this material for three to four weeks in RO or distilled water in a zip-lock plastic bag. The results are fantastic. Because of the high tannin content, all plants have rich colors. The pitchers of *N. sanguinea* are deep red even in a weak light environment. It takes a while for plants moved from another soil mix to get used to this new material. I estimate new growth starts in a month. Adding a layer of living *Sphagnum* moss to the top of each pot of this material makes the moss grow very green and vigorous. And it looks nice."

Tim Williams (132-8 Sannai, Akiruno Shi, Tokyo 190-01 Japan, tim@jint.jasco.co.jp): "My two bob's worth: 80% Orchid mix and 20% long fibre *Sphagnum* moss seems quite good, since the mix contains bark and perlite. I used this stuff first since Adrian Slack's book recommends it, and it is readily available. I would like to try some plants in other mixes but am wary of disturbing the spider-web-like *Nepenthes* root systems, and anyway none of my plants have yet definitely outgrown a pot."

Paul Burkhardt (717 Arlington Ct., Champaign, IL 61820 USA, burkhard@aries.scs.uiuc.edu): "I have two mixes that I have been using with relative success: two parts peat moss, two parts silica sand, and one part charcoal (or fir bark), or four parts fir bark, four parts charcoal, two parts peat moss and one part silica sand. The second mix is much airier due to the increase in fir bark and charcoal. The charcoal is a substitute for perlite. I would like to obtain pumice (not refined into perlite) or clay beads to substitute for the fir bark and charcoal."

Al Bickell (701 Rossland Rd. E., Box 271, Whitby, ON Canada L1N9K3, bickell@idirect.com): "We have adapted an orchid growing technique for use in growing *Nepenthes*. It seems to work well with all the species we grow in the greenhouse. The base of the plant is wrapped into a ball of long fiber *Sphagnum* moss the size of a baseball. Two inches of white styrofoam (coloured are phytotoxic) peanuts are placed on the bottom of the pot and the *Sphagnum* ball is set on top. The 1" space around the ball is filled with medium grade orchid bark so that the ball is covered with the bark. We use plastic pots to help maintain humidity within the pot. Since the ball is not exposed to air, it dries out very slowly. This maintains a constantly moist, but not sodden environment for the *Nepenthes* roots. If water collects in the base of the pot only styrofoam sits in it and the organic medium does not go sour. Large air spaces within the pot supply roots with abundant oxygen as they would receive in the wild."

Dave Evans (17 North 12th St., Kenilworth NJ 07033 USA, t442119@rutadmin.rutgers.edu): "One part each peat moss, silica and pine bark and one half part fine charcoal. The bark is chopped very small by hand and keeps the mix from compacting. As time goes on, the mix degrades and loses peat. If the soil is still good but is missing so much peat that it dries out quickly (stressing the plants if I am gone for a couple of days) I will take a fork and work peat moss into the soil around the root ball, instead of repotting."

Charles Brewer (2413 Farmers Ct., Virginia Beach, VA 23456 USA, brewer_charles@ecomail.damneck.navy.mil): "I am not a big *Nepenthes* grower, I just have a few and they seem to be doing nicely. I use a mix of the following: one-to-one peat, perlite, dried *Sphagnum*, general orchid bark, burnt pine straw."

*N. ventricosa* by B. Meyers-Rice

(Charles writes that the pine straw—dried pine needles—is measured prior to burning. Once burned, he adds the ashes to the mix, wets everything down, and lets it season for two weeks before using it.—JL)

Trent Meeks (400 East Atlantic Blvd. #8, Pompano Beach, FL 33060 USA, esoft@ix.netcom.com): "Perlite (two grades), Aliflor (clay pellets), pumice, seedling grade fir bark, long-fiber *Sphagnum* moss, Canadian *Sphagnum* peat moss and silica sand. Unfortunately, I don't measure the components out, but mix by 'eye' or 'feel.' Best to describe as fluffy and rapidly draining."

Mark Pogany (33953 White Rd., Willoughby Hills, OH 44092-1350 USA, markp@crscms.com): "I use the following mixture (all ingredients are by volume): 40% pine bark chips (this stuff is easy to acquire here and comes in large bags, used for mulching beds), 20% chopped *Osmunda* fiber, 10% peat moss, 10% large-grained silica sand, 10% long-fibered *Sphagnum* moss, 5% perlite (horticultural grade), 5% horticultural charcoal. This mix drains well and seems to work great for both my lowland and highland plants. The last time I potted up some *Nepenthes* I took a pH reading from the above mix. It came in between 5.0 - 5.5."


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# The Carnivorous Flora of Gunung Bandahara

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Keywords: travelogue: *Nepenthes*, Sumatra.

In March 1996 a party consisting of eleven people (six Indonesian, four German and one Englishman) undertook a seven day expedition to explore Gunung Bandahara. This mountain is in the Leuser National Park, Aceh Province, Sumatra.

Although we expected to find *Nepenthes* at the higher altitudes of this mountain, we could not be sure which species would be present. Since the collections of van Steenis (1937) the following species are known to occur within the borders of the park: *N. densiflora* (Danser, 1940: G. Leuser, Goh Lemboeh, Pucuk Agosan), *N. mikei* (Salmon & Maulder, 1995: G. Leuser, Goh Lemboeh), *N. spectabilis* (Danser, 1928: G. Kemiri) and *N. tobaica* (Danser, 1928: G. Kemiri, Goh Lemboeh, Pucuk Agosan).

The climb began at a village near Kutacane on the Trans-Sumatran highway. We distributed the weight among back-packs and commenced walking through the village and past the local school into lowland plantation land. Growing in the plantation were coffee plants (kopi), breadfruit trees and rubber trees, to name but a few. Suddenly we were attacked by very aggressive wild bees. Some of us could not escape fast enough and had to crouch down until the bees' rage was over. Then our group carefully reformed at a safe distance. The very painful stings were treated, and we progressed on through the intense heat of the plantation to a lowland rainforest. Its shade was welcome but the high humidity was not. The climb continued past beautiful rainforest trees onto rattan clad slopes, making progress slow through the thick undergrowth. Lack of water at this point also made things harder, however we found a huge forest sump or puddle close to our first camp for the night.

Figure 1: Upper pitcher of *N. spectabilis* (H. Rischer).

After an early start the next morning, we eventually reached a small cloud forest at midday. The altitude was around 1800 metres. The pain from our exertions subsided at the sight of our first *Nepenthes*, a huge and most beautiful form of *Nepenthes spectabilis* (Figure 1). A lot of small rosettes grew in *Sphagnum* and larger plants climbed high upon trees. The pitchers were larger and peristomes more flamboyant than those of other forms of *Nepenthes spectabilis*. Captured insects in the upper as well as in the lower pitchers were mainly beetles. Both pitcher types also contained living mosquito larvae.

Figure 2: Young plants of *N. mikei* (H. Rischer).

Figure 3: Lower pitcher of *N. diatas* growing in dense mossy forest (H. Rischer).

Figure 4: Stunted plant of *N. diatas* growing on the top of G. Bandahara (H. Rischer).

Some metres further on grew plants of the more familiar *N. tobaica*.

Day three took us higher into the cloud forest and at approximately 2200 m *N. mikei* (Figure 2) took the place of *N. spectabilis*. This species occurs also on G. Pangulubao situated about 200 km to the southeast (Salmon & Maulder, 1995). Additionally a very different *Nepenthes* began to appear. This species had pitchers that were light maroon in colour with a spiked peristome (Figure 3). The plant seemed to be an unusual form of *N. singalana*, however we were to find out later that it had been previously collected in 1972 and was in the process of being described as *Nepenthes diatas* (Jebb & Cheek, 1997). This species is very strong and

vigorous with a firm woody robust appearance. Pitchers reached 35 cm in length and were very abundant as we climbed a huge ridge covered in *Sphagnum*, in pursuit of the summit. This was vividly illustrated by the fact that the native rattan collectors working as our guides called a campsite that we came to "Camp Tetakur," which means "*Nepenthes* camp." At an altitude of 2500 m *N. mikei* disappeared. In this transition zone, hybrids of the two species were found.

To our surprise the ridge widened into a huge flat mountain bog. Water was plentiful as were thousands of seedling *Nepenthes* and *Drosera spatulata* carpeting the floor. We made camp on quaking ground as darkness was approaching fast. The following morning we briefly explored the area and found bigger plants of *N. diatas* climbing in the larger patches or copses of vegetation. It seemed that the seedling *Nepenthes* among the grasses and sedges of the bog floor were unable to flourish without the cover and anchorage of taller, woodier vegetation.

We ventured towards the summit and observed that *N. diatas* had completely changed its form of growth. It became stunted at a height of about 40 cm and each plant supported only two or three functional leaves and pitchers (Figure 4). They were dark red and leathery due to the high ultraviolet radiation intensity. The plants resembled *N. densiflora*, a fact overlooked in the original description of *N. diatas*, which was based exclusively on material from 2400-2600 m. Indeed, there seems to be a gradual change towards the characters of *N. densiflora* from mountain to mountain. For example, the plants from G. Kemiri correspond in all respects with *N. diatas* except that the pitchers are always funnel shaped without a waist very similar to *N. densiflora* (Marthaler, 1997).

The prey in the pitchers of the plants growing here in very open places were clearly different from those occurring further down in the forest. Here it consisted mainly of ants, which we found still crawling on pitchers and flowers at 6 PM when it was already dark and foggy. In the pitchers of the forest plants, beetles, spiders and centipedes were found, but all pitchers had been colonized with mosquito larvae (Culicidae). All stages of flower development were found on neighboring plants, from closed flower buds to ripe fruits. Another interesting fact was that plants only 30-40 cm tall were producing upper pitchers. We deduced that this was adapting the plant to the more extreme climatic conditions encountered close to the summit. Vegetation was dominated by *Rhododendron* species and many orchid genera (e.g. *Dendrochilum* and *Epigeneium*). The temperature during the day was 20°C but at night or after rain it dropped to 5°C within minutes. At nearly 3000 m, small hollows in the ground filled with rain water for a short period after the frequent thunderstorms. Around those hollows were *Utricularia* together with *Drosera spatulata*.

Unlike the plants, our guides did not like the low night temperatures. This and our dwindling food supply forced us to turn back. After two nights on the summit we descended the mountain in two days to a warm reception from the villagers.

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# Book Review

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Jezek, Zdenek. 1997 Masozrave rostliny (Carnivorous Plants), ISBN 80-85362-27-9. 64 pages, 16 drawings and 8 pages of plates including 22 color photos, soft cover. In Czech. Cost and Availability: 49 Kc (about US$2.00). The book can be bought for US$7.00 (including airmail) worldwide. Within Europe the price including postage is US$5.00. Copies can be ordered through: Darwiniana, Ivo Koudela, Okruzni 25/21, Zdar nad Sazavou, 591 01, Czech Republic. (Ivo Koudela has offered to act as a distributor, but does not profit from any book sales.)

This small book is only the second about carnivorous plants published in the Czech language after the pioneering work by Miloslav Studnicka in 1984. The book aims at readers with no or little knowledge about carnivorous plants. It tries to convince the reader that these plants are not only very interesting but that many of them can also be easily grown under amateur conditions.

After the preface and general chapters, all the carnivorous plants are divided into five groups according to the trapping mechanisms: 1)*Sarracenia, Heliamphora, Cephalotus, Darlingtonia, Nepenthes, Brocchinia, Catopsis*; 2)*Drosera, Ibicella, Triphyophyllum, Drosophyllum, Pinguicula, Byblis, Roridula*; 3)*Dionaea, Aldrovanda*; 4)*Utricularia*; 5)*Sarracenia psittacina, Genlisea*. The chapter about *Utricularia* does not follow Taylor's monograph: it deals with *Polypompholyx* and *Biovularia* as separate genera. The concluding chapters describe the Czech carnivorous plant society (Darwiniana) and its activities, and lists several foreign and domestic organizations, growers, and firms dealing with carnivorous plants. Selected publications and Darwiniana newsletters are listed as well. The final part of the booklet consists of 8 color plates with photographs.

As for the print, I think it could be slightly crisper. However, the main attractions of this new booklet for those who cannot read Czech are the drawings and especially the photographs, some of them are very nice (e.g. a *Nepenthes* from Penang, Malaysia). A plant labeled erroneously as *Drosera affinis* is in fact *Drosera adelae*.

The writing is rather unbalanced—you can find technical and colloquial expressions mixed together. In the same paragraph containing terms like scarification or hibernaculum you find nearly poetic names like "Death dew of minute beauties (*Drosera*)" or "Mysterious inhabitants of the Lost World—sun pitchers (*Heliamphora*)." I also do not like too many exclamation and quoting marks and parentheses.

What about the content itself? I think the author gives really good advice to beginning growers and in this way fills the gap in the Czech market where no other book on this subject can be found. However, there are a few errors which experienced growers will detect easily.

As a conclusion, I think this book can be valuable for everyone who can read Czech/Slovak, likes pictures of carnivorous plants, or simply wants to have all the books written about these wonderful plants. Even though it cannot be compared with the splendid Japanese books on this subject, it does have its own charm.

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